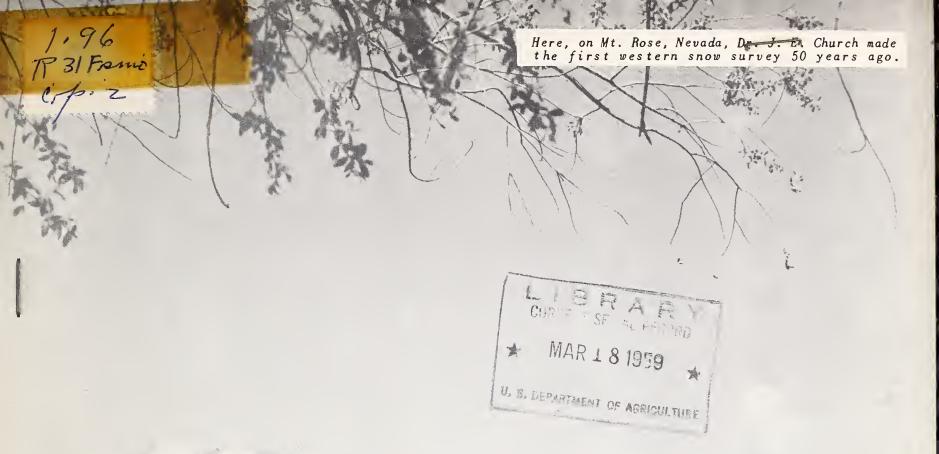
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FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEY and WATER SUPPLY FORECASTS for

MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE, and MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, U.S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and private organizations.

MAR. 1, 1959

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

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The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS RIVER BASINS	ISSUED	COOPERATING WITH	LOCATION
	MONTHLY (FEBMAY)	Colo. Exp. Station	
COLUMBIA Includes Alaska	MONTHLY (JANMAY)		BOISE, IDAHO
UPPER MISSOURI	Monthly (FEBMay)	Mont.Agr.Exp.Station	BOZEMAN, MONTANA
WEST-WIDE	(OCT, 1, APR, 1 AND MAY 1)	COOPERATORS	Portland, Oregon
STATES			
ARIZONA		SALT R. VALLEY WATER	PHOENIX, ARIZONA
NE VADA	MONTHLY (FEB APR.)	NEVADA STATE ENGINEER	RENO. NEVADA
ORE GON	MONTHLY (JANMAY)	ORE.AGR.EXP.STATION	PORTLAND, OREGON
UTAH	MONTHLY (JANMAY)	UTAH STATE ENGINEERUTAH AGR.EXP.STATION	SALT LAKE CITY, UTAH
Washington	Monthly (FebMay)	Wash. State Dept. OF Conservation	SPOKANE, WASHINGTON
WYOMING	Monthly (Feb. June)	WYOMING STATE ENGINEER	CASPER, WYOMING
Copies of the	e various reports may be	secured from: Head, Water Supp Soil Conservatio	oly Forecasting Section

PUBLISHED BY OTHER AGENCIES

209 S.W. 5th Avenue, Portland 4, Oregon

OTHER SNOW SURVEY REPORTS		
BRITISH COLUMBIAMONTHLY	(FEBJUNE)	
	AND FORESTS, PARLIAMENT BLDGS, VICTORIA, B.	
CALIFORNIAMonthly	(FEBMAY)	S.

FEDERAL-STATE-PRIVATE COOPERATIVE

SNOW SURVEYS and WATER SUPPLY FORECASTS

for

MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report Prepared by:

A. R. Codd Hydraulic Engineer Soil Conservation Service

Soil Conservation Service
U. S. Department of Agriculture
and
Montana Agricultural Experiment Station
Bozeman, Montana

Report Issued by:

H. D. Hurd State Conservationist of Montana 0. W. Monson
Irrigation Engineer
Montana Agricultural
Experiment Station

R. E. Huffman
Director
Montana Agricultural
Experiment Station



WATER SUPPLY OUTLOOK FOR MONTANA March 1, 1959

* The March first Water Supply Outlook for Montana, gen-* * erally, is GOOD. * * 3% The Missouri Basin streams in Montana are expected to * flow between 81 and 104 percent average. 36 3% 36 * ÷ The Columbia Basin streams in Montana are expected to flow between 113 and 150 percent average. Exceptionally * large snow water content figures exist on the Flathead * River, Swan and Blackfoot Basins. Many of them are re-3% * cord highs for March first. 2% عد Storage in hydro and irrigation reservoirs is about aver- * age for March first. No marked shortage exists. February stream-flow continued above average.

MISSOURI RIVER BASIN

JEFFERSON RIVER:

March first snow surveys indicate a fair snow-pack on the tributary basins to the Jefferson River. Stream-flow forecasts indicate 81 percent average at Monida, 85 percent at Barratts, and 92 percent on the Big Hole River. These forecasts show five percent less flow than last season. The apparent drought condition of southeastern Idaho is showing its affect on the headwaters of the Beaverhead River. Detail volume forecasts and comparisons are shown on the forecast sheets.

MADISON RIVER:

The Madison River Basin has a good snow-pack for March first. There is 18 percent more water content than last year. Stream-flow into Hebgen Reservoir should be 93 percent average. Hebgen Reservoir is 72 percent below average; however, with the anticipated 384,000 acre-feet forecast for April through September, there should be little difficulty in filling the reservoir.

GALLATIN RIVER:

March first snow surveys indicate a ll percent average snow-pack this season. This should result in an excellent water supply for most of the irrigation season, with local shortages occurring only during the last months.



MISSOURI RIVER MAIN STEM:

There is an excellent water supply on the mountains of the tributaries to the Missouri from Toston to Fort Benton. The exceptionally deep snow on the Continental Divide from Stemple Pass, opposite Wolf Creek, north to the Canadian border will produce an excellent water supply this season with considerable surplus.

Gibson Reservoir is forecast to receive 787,000 acre feet of water between April first and September 30 or 137 percent average.

Detail figures and comparison data are listed in the forecasts of stream-flow.

COLUMBIA RIVER BASIN

CLARK FORK RIVER:

An exceptionally large snow-pack exists on most of the tributary streams to the Clark Fork River. An average of the snow water content measured on the 21 snow survey courses shows this year's March snow-pack to be 135 percent average. The anticipated stream-flow from the Blackfoot River is forecast at 150 percent average and from the Bitterroot, 105 percent. The apparent Idaho drought condition is reflected in this southerly stream.

FLATHEAD RIVER:

A record high March first snow-pack exists on many of the snow courses in the Mission Range, Swan Range, and in the South Fork of the Flathead. Providing a normal accumulation of snow is experienced during March, the northern tributaries to the Flathead should produce 115 percent normal flow at Columbia Falls. The South Fork is forecast at 118 percent average or 2,446,000 acre feet for the April-September period.

SWAN RIVER BASIN:

The Swan River Basin is located in the heaviest snow-pack belt. Attention is directed to measurements of snow survey courses Big Creek, Strawberry Lake, Trinkus Lake, Upper Holland Lake and North Fork Jocko. Comparison with average data for these courses is startling. These and many other courses in the Flathead Basin have a greater water content than the April first average. This condition will bear watching for exceptionally large spring flows. High temperatures and clear days could cause rapid melting.



The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature during the forecast period will be near average. Appreciable deviations from normal of temperature and/or precipitation during the forecast period will correspondingly modify these forecasts.

	Seasona	al Stream	1-Flow in T	housands	of Acre	Feet
UPPER MISSOURI RIVER	FORECAST	%	FORE-	,		1938-52
IN MONTANA	RUNOFF	15-Yr.	CAST	Measured		Average
		AVG.	PERIOD	1957##	1956	<u> </u>
RED ROCK RIVER						1
Monida (near) (1)	65.4	81	Apr-Sept	104	60	81
#5	61.2	81	Apr-July	100	58	76
BEAVERHEAD RIVER	01.02		taba o oraș	200		
Barratts (at)	151	85	Apr-Sept	204	155	177
#9	115	86	Apr-July	162	122	134
BIG HOLE RIVER			1 0			
Melrose (near)	682	92	Apr-Sept	720	842	745
#85	631	92	Apr-July	686	796	687
JEFFERSON RIVER						
Sappington (at)	955	90	Apr-Sept	1028	1045	1057
#1/4	848	90	Apr-July	964	967	938
MADISON RIVER	7.05	0~	4 0 1	000	044	7.00
West Yellowstone (near)	187	95	Apr-Sept	220	255	198
#104	143	95	Apr-July	168	200	151
Grayling (near) (2)	389	93	Apr-Sept	454	488	420
#106 (Net inflow to Hebgen Lk)		92	Apr-July	361	402 802	333
McAllister (near) (3)	673	93	Apr-Sept	750 615	672	726 585
#109 GALLATIN RIVER	543	93	Apr-July	015	012	303
Gateway (near)	457	103	Apr-Sept	469	499	445
#114	393	102	Apr-July	406	443	384
Logan (at)	492	103	Apr-Sept	446	512	478
#116	421	103	Apr-July	386	452	410
Hyalite Cr. R.S. (at) (7)	37.6	107	Apr-Sept	34	29	35
#118	32.1	107	Apr-July	30	25	30_
MISSOURI RIVER				Promise de la companya de la company		
Toston (at) (3)	2134	84	Apr-Sept	2187	2345	2535*
#15	1805	82	Apr-July	1956	2098	2191*
Fort Benton (at) (4)	3372	100	Apr-Sept	3032	3131	3381
#25	2842	99	Apr-July	2608	2722	2874
Virgelle (at) (4)	4172	104	Apr-Sept	3500	3261	4013
#26	3562	103	Apr-July	3019	2806 3588	3445 4357
Zortman (near) (4)	4497	103	Apr-Sept	3739 3208	3076	3726
#27	3827	103 101	Apr-July Apr-Sept	3365	3290	4362
Ft. Peck Dam (below) (5)	4411 3822	104	Apr-July	2728	2613	3666
#29 Williston, N.D.	10857	92	Apr-Sept	11203	9673	11750
#33	9385	92	Apr-July	9527	8102	10228
				the survey of the second second		

Observed flow plus change in Storage in Lima Reservoir. Observed flow plus change in Storage in Hebgen Lake.

Observed flow plus change in Storage in Hebgen and Ennis Lakes. Observed flow plus change in Storage in Canyon Ferry.

Observed flow plus change in Storage in Canyon Ferry and Ft. Peck Reservoirs. Observed flow plus change in Storage in Hyalite Reservoir.

Preliminary data furnished by U. S. Geological Survey, subject to correction. Less than 15 yrs. in 1938-52 period. Average for 15 yrs. nearest the base period.



MONTANA STREAM-FLOW FORECASTS MARCH 1, 1959

	Seasonal Stream-Flow in Thousands of Acre Feet									
UPPER MISSOURI RIVER IN MONTANA	FORECAST RUNOFF	% 15-Yr. AVG.	FORE- CAST PERIOD	Measured 1957##	d Runoff	1938-52 Average				
SUN RIVER										
Net Inflow to Gibson	787	137	Apr-Sept.	531	668	573				
#1535 Reservoir	719	137	Apr-July	488	618	524				
MARIAS RIVER				11.11.5						
Shelby (near)	650	123	Apr-Sept	519	684	527				
#178	597	124	Apr-July	486	617	482				
MUSSELSHELL RIVER			and the second s		1					
Delpine (near)	7.9	116	Apr-Sept	6.0	4.8	6.8*				
#216	6.5	116	Apr-July	4.9	4.1	5.6%				
YELLOWSTONE RIVER						0				
Corwin Springs (at)	1776	95	Apr-Sept	1964	2427	1870				
#317	1482	95	Apr-July	1643	2099	1556				
Livingston (near)	2022	95	Apr-Sept	2272	2689	2134				
#318	1669	94	Apr-July	1902	2322	1770				
Billings (at)	3625	90	Apr-Sept	5133	4788	4025				
#319 William City (at)	3 1 12 5775	90 91	Apr-July	4521 7762	4225 6175	3446 6369				
Miles City (at) #323	4942	91	Apr-Sept Apr-July	6764	5324	5421				
Sidney (near)	5981	90	Apr-Sept	7623	6114	6648				
#326	5182	91	Apr-July	6735	5315	5724				
SHIELDS RIVER	7202	<u> </u>	npi cary							
Clyde Park (at)	98.1	93	Apr-Sept	76.5	97.0	105.6				
#335	91.4	93	Apr-July	71.8	94.2	98.0				
ROSEBUD RIVER										
Absarokee (near)	254	97	Apr-Sept	372	251	263				
#356	205	97	Apr-July	321	208	212				
STILLWATER RIVER					4. 100					
Rosebud Cr. (above)	315	95	Apr-Sept	463	343	331				
#3515	275	95	Apr-July	413	321	288				
Absarokee (near)	564	95	Apr-Sept	850	611	594				
#352	474	95	Apr-July	750	529	500				
ROCK CREEK	7.00	2		,	7.01	7.07				
Red Lodge (near)	103	96	Apr-Sept	154	134	107				
#365	78.5	96	Apr-July	129	110	82				
CLARK FORK RIVER	۲۶۵	7.00	Ana Sont	קוב	716	580				
Chance (at) #360	578 518	100 100	Apr-Sept	715 649	660	517				
			Apr-July			614				
						539				
Edgar (at) #362	599 529	98 98	Apr-Sept Apr-July	785 706	773 698					

^(##) Preliminary data furnished by U. S. Geological Survey, subject to correction (*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.



MONTANA STREAM-FLOW FORECASTS MARCH 1, 1959

	Season	al Stream	m-Flow in T	housands	of Acre	Feet
UPPER COLUMBIA RIVER IN MONTANA	FORECAST RUNOFF	% 15-Yr. AVG.	FORE- CAST PERIOD		d Runoff 1956	1938-52 Average
CLARK FORK RIVER						
Bonner (above) (14)	901	117	Apr-Sept	655	880	771
#4155	793	117	Apr-July	580	780	678
	686	118	Apr-June	522	695	583
Missoula (above)	2271	142	Apr-Sept	1577	2012	1602
#415	2032 1767	142 144	Apr-July Apr-June	1425 1292	1817 1622	1429 1229
Missoula (below)	3829	129	Apr-Sept	2979	3960	2971
#439	3491	129	Apr-July	2764	3654	2700
11437	3058	131	Apr-June	2524	3290	2335
St. Regis (at)	5142	130	Apr-Sept	4108	5749	3951
#442	4664	130	Apr-July	3787	5326	3588
	4132	133	Apr-June	3450	4817	3112
Plains (near) (15)	13093	122	Apr-Sept	11159	15138	10747
#503	11955	122	Apr-July	10459	14070	9813
	10275	122	Apr-June	9527	12531	8434
Thompson Falls (at) (15)	14325	125	Apr-Sept	11517	15920	11479
#504	13103	125	Apr-July	10802	14809	10500
0.1:	11242	125	Apr-June	9847	13188	9009
Cabinet Gorge (at) (15) #507	15239 13961	125 125	Apr-Sept Apr-July			11186
#501	11961	125	Apr-June			9584
BLACKFOOT RIVER	11701	14	api -ouic			7704
Bonner (near)	1370	152	Apr-Sept	922	1132	896
#414	1234	152	Apr-July	844	1037	811
	1065	154	Apr-June	769	927	693
BITTERROOT RIVER	The second secon					
Darby (near)	549	105	Apr-Sept	515	740	525
#1422	510	105	Apr-July	483	701	487
	446	104	Apr-June	441	649	429
Missoula (near) (16)	1596	117	Apr-Sept	1402	1948	1369
<i>#</i> 438	1500	118	Apr-July	1340	1837	1270 1106
	1342	121	Apr-June	1232	1668	TT00

⁽¹⁴⁾ Difference in observed flow, Clark Fork above Missoula & Blackfoot at Bonner.

⁽¹⁵⁾ Observed flow plus change in Storage in Flathead Lake & Hungry Horse Reservoir. (16) Difference in observed flow, Clark Fork above and below Missoula. (##) Preliminary data furnished by U. S. Geological Survey, subject to correction.



MONTANA STREAM-FLOW FORECASTS MARCH 1, 1959

•	Season	al Stream	m-Flow in T	housands	of Acre	Feet
	RECAST UNOFF	% 15-Yr. AV G.	FORE- CAST PERIOD	Measured	Runoff 1956	1938-52 Average
FLATHEAD RIVER						
Columbia Falls (near)	1955	113	Apr-Sept	1798	2308	1729
(North Fork)	1781	113	Apr-July	1681	2139	1575
#444	1533_	113	Apr-June	1523	1864	1350
Columbia Falls (at) (17)	6453	115	Apr-Sept	5716	7164	5619
#458	6016	115	Apr-July	5411	6720	5214
	5272	116	Apr-June	4962	5959	4530
Polson (near) (15)	7594	115	Apr-Sept	6525	8603	6612
#469	7064	115	Apr-July	6240	8082	6150
MIDDLEFORK FLATHEAD	6107	115	Apr-June	5715	7137	5317
RIVER				1		
West Glacier (near)	1901	115	Apr-Sept	1764	2093	1659*
#450	1759	114	Apr-July	1672	1956	1540*
COURT TODA TARITAD	1485	112	Apr-June	1524	1712	1330%
SOUTH FORK FLATHEAD RIVER						
Columbia Falls (near) (17)	2446	118	Apr-Sept	1976	2593	2058
(Net inflow to Hungry	2322	119	Apr-July	1857	2488	1950
Horse Reservoir)	2069	120	Apr-June	1778	2279	1724
#457					,	
SWAN RIVER	0-1	- >		1		-/O:
Big Fork (near)	816	140	Apr-Sept	575	750	584
#466	726	140	Apr-July	520	676	518
	604	141	Apr-June	451	581	427

⁽¹⁵⁾ Observed flow plus change in Storage in Flathead Lake & Hungry Horse Res. (17) Observed flow plus change in Storage in Hungry Horse Reservoir.

^(*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

^(##) Preliminary data furnished by U. S. Geological Survey subject to correction.





INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

Drainage Basin and Course Name	Montane Number	Elev.	Locat Sec. Lat.		Range Long.	Record Began	Feasuring Dates	Measured By	Drainage Basin and Course Hame	Montana Number	Elev.	Locati Sec. Lat.	on Twp.	Range	Record Began	Measuring Dates	Measured By	Drainage Basin and Course Name	Montana Number	Elev.	Location Sec.	on Twp.		Record Began	Measuring h	leasured By
JEFFERSON RIVER (ROCK-BEAVER	AHEAD)	MISS	OURI RIV	TER DRAIN	NAGE				(UPPER YELLOW		(ISSOURI	RIVER DR	AINAGE	(cont.)				(TONGUE RIVER	cont.)	MISSOURI	RIVER D	RAINAGE	(cont.)			
Lakeview Bidge	11E3	7400	27	ນມຣ	SM	1948	3,4,5	10	Camp Senia	9D1	7890	2 - -	88	183	1937	1 2 2 1 5	1 6	Horse Trail Div.	7E19 7E16	9200 9000	29	55N 52N	90W 86W	1956 1956	2,3,4,5	1
Lakeview Canyon Limokiln White Pine Ridge (HORSE PRAIR		6930 6950 8850	26 5 18	148 158 148	9W 9W	1948 1948 1948	3,4,5 3,4 3,4	10 1	Canyon Cooke City Crevice Mt. Independence Lake Camp	10E3 10D7 10D5 10D6 10E4	7750 7400 8400 8000 7850	25 22 22 144°-34°		14E 9E 12E 110°-24	1937 1935 1940 1936	1,2,3,4,5 1,2,3,4,5 3,4 3,4 1,2,3,4,5	6 2 1 6	North Tongue Sibley Lake Sucker Creek Steamboat Point	7515 7511 7512 7510	8800 8000 9000 7500	17 10 19 32	55N 55N 55N 56N	89W 88W 87W 87W	1956 1956 1956 1956	2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5 2,3,4,5	1 1 1 1
Bloody Dick Gold Stone	13D10 13D2	7600 8100	12 11	83 83	16W 16W	19կ8 19կ8	3,4 3,4	1	Lupine Creek Lodgepole	10E1 9E1	7300 8200	1 بلبا *=5لبا 32	56n	110°-37° 106⊌	1938 1940	1,2,3,4,5	1,4	Wood Rock G.S. (POWDER RIVER	7513	8500	3	Slin	88W	1956	2,3,4,5	1
Lemhi Pace Terreil Creck	13E1 13D12	7480 6650	9	103 93	15W 15W	1948 1948	3,4 3,4 3,4	1	(SHIFLDS RIVE				1			2.1	,	Crasy Woman	6E2	8200	6	L7N	8LN	1956	2,3,4,5	1
Trail Creek Selway Junction	1362 13011	7090 6800	15 27	103 85	15W 15W	19կ8 19կ8	3,4 3,4	1	Porcupine LOWER MELLOWSTONE	1003	6500	10	LiΝ	105	1938	3,4	1	Muddy Creek O.S. Munkere Pase North Powder #2	6 <u>E1</u> 7E8 7E36	7800 9700 8300	11 20	և8N և8N և7N	8นท 85พ 85พ	1956 1950 1956	2,3,4,5 2,3,4,5 2,3,4,5	1
(BIG HOLE)			-0		. 0	2 0 1 0	2.1		(WIND RIVER)									Onion Gulch Soldier Park	7E27 7E5 7E6	8100 8700	31 36 17	1,8N 51N 1,9N	85W 85W 84W	1956 1950 1936	2,3,4,5 2,3,4,5	1
Big Hole Pass Big Hole Pass-Be East Boundary	13D3 13D4 13D5	7240 6900 6700	28 2l ₄ 22	38 38 38	18W 18W 17W	1948 1948 1948	3,և 3,և 3,և	1 1	Big Warm Brecke Lake #3	9F12 10F8	8800 9200	36 23	LL2N LLLN	109W 110W	1955 1939	2,3,4,5	1	Sour Dough	750	8500 COL		VER BASI		1930	2,3,4,5	1
Oibbons Pass Jahnke Oresk	13D2 13D8	7100 7340	4 25	2S 7S	19W 16W	193կ 19կ8	1,2,3,4,5 3,4	1,3	Burreughs Creek Dinwoodie	9FL 9F10	8800 10000	15 21	143N 39N	107W 105W	1948 1948	2,3,4,5 2,3,4,5	1	KOOTENAI RIVER								
Miner Porks Miner Lake	13D6 13D7	7300 6720	2կ 10	63 63	17W 16W	1948 1945	3,4,5	ì	Dry Creek DuNoir East Pork	9 F 9 9 F 6 9F13	9500 8750 9200	34 27 23	FFN FSN FN	6W 108W 104W	1948 1940 1956	2,3,4,5 2,3,4,5 2,3,4,5	1	Baree Creek Baree Mountain	15B11 15B1	5500 6000	6 1	25N 25N	30W 31W	1956 1937	4,5,5 3	
(WISE RIVER)		****			2011	2010	2.1		Geyser Creek	9F7 9P8	8500 9500	12 24	PTN PTN	108W 108W	1948 1948	2,3,4,5	1	Red Mountain Weasel Divide	15A1 14A7	6000 5450	<u>ل</u> 8	36N 37N	57A 53A	1937 1955	3,4,5,53 4,5,53	1,2
Anderson Mdw. Elk Horn Wiss River	13D14 13D15 13D13	7000 8450 6 3 00	18 15 15	3S 4S 2S	12W 12W 12W	1948 1935 1948	3,և 3,և,5 3,և	3	Sheridan R.S. #1 Sheridan R.S. #2 T-Crees Ranch	9 F 5 9 F1 4 9 P 3	7500 7500 8000	3	և2N և2N և3N	109W 109W 107W	1939 1955 1940	2,3,4,5 2,3,4,5 2,3,4,5	1	FLATHEAD RIVER Basin Creek	138144	5000	ш	19N	12W	1951	2,3,4,5	2
(RUBY RIVER)									Togwotee Pase	1079	9600	29	البليا	110W	1936	2,3,4,5	11	Big Creek Brush Creek	1383 1444	6750 5000	6&7 13	22N 30N	18W 26W	1941 1937	3,4,5 3,4,5	5 1,2
Flashlight	12D3	6950	22	BS	7W	1945	3,4,5	1	(POPO AGIE RI Blue Ridge	VER) Wyomi 802	9500	23	31N	101W	1939	2,3,4,5	1	Cattle Queen Decert Mountain Hell Roaring Div.	13A1 13A2H 11iA3	4 7 00 5600 5770	24 35	35N 31N 32N	17W 19W 22W	1939 1937 1942	3,4,5 1,2,3,4,5 3,4,5	1,2
MADISON RIVER									Bruce's Camp Hobb'e Park	805 903	6500	2կ 22	32N 2S	101W 3W 3W	1955 1948	2,3,4 2,3,4,5	1	Holbrook Kiehenehn	13B13A 14A6	4530 3886	18 14	21N 37N	13W 22W	1951	1,2,3,4,5 4,5	6
Hebgen West Yellowstone	11E5 11E7	6550 6700	22 34	113 138	3E 5E	193կ 193կ	1,2,3,4,5 1,2,3,4,5	3 3	Moequito Park R.S Sawmill Glade South Pass	904 801 803	9500 8500 9000	23 3 13	31N 30N	101W 101W	1940 1939 1939	2,3,4,5 2,3,4,5 2,3,4,5	1	Logan Creek Marias Pase Mineral Creek	11;45 1345M 13416	4300 5250 4000	3lı 29	30N 30N 35N	2կ\ 1կ\ 17\	1937 1934 1957	3,4,5 1,2,3,4,5 3,4,5	3
Norrie Baein	1062	7500	الاروائا ،		1100-42	1936	3,4	6	St. Lawrence Trout Cresk	9F11	9000 8400	26 5	1N 2S	5.M F/M	1940 1948	2,3,4,5	1	Quintonkon Spotted Bear Mt.	13A13 13B2H	3800 7000	11 23	26N 25N	17W 15W	1951 1948	2,3,4,5 3,4,5	1,2
									(OWL CREEK) W	yoming 9F2	8900	6	43N	102W	1948	2,3,4,5	1	Strawberry Lake Trinkus Lake Trout Lake	13A10 13B1 13A12H	6500 6500 3600	11 9 21	28N 25N 28N	19W 17W 17W	1948 1948 1948	3,4,5 3,4,5 3,4,5	2 1,2
OALLATIN RIVER Devil'e Slide	1004	61.00	21	~ 0	/ 5				Owl Creek	8F1	8700	36	143N	101W	1948	2,3,4,5	1	Twin Creeks Upper Holland Lk.	13811	3580 7000	14 28	20N	16W 16W	1951	2,3,4,5 3,4,5	1,2
Hood Headow New World	10D3 10D1	6100 6600 6700	57 55 77	58 48 38	6E 6E 6E	1935 1935 1939	2,3,4,5 2,3,4,5 1,2,3,4,5	2,1 2,1 7	(GREYBULL RIV	9E2	8800	25-	47N	103W	1948	2,3,4,5	1	CLARK FORK Baree Creek	15811	5500	6	25N	30W	1956	4,5,5	2
21-Mile	11E6	7150	1	115	5E	1934	1,2,3,4,5	3	Timber Creek #2 Wood River #1	9E3 9F1	8600 8000 8000	25 28 28	1.7N 1.6N 1.6N	103W 103W 103W	1955 1939 1956	2,3,4,5 2,3,4,5	1 1 1	Baree Mountain Coyote Hill	15B1 13B10	6000 4200 7800	1 12 23	25N 18N 8N	31W 16W 12W	1937 1952 1949	4,5,5 1,2,3,4,5	2 2
MISSOURI RIVER MA									Wood River #2 (SHOSHONE RIV	9F15 ER) Wyondin		20	ffcu	103#	1730	2,3,4,5	1	El Gorado Mine Fred Burr Pase Preezeout Summit	1309 13011 15810	8000 6800	12 21	6N 15N	13W 27W	1957 1937	3,4,5 4,5	1 2
Crystal Lake Oraeshopper	1205 901 1002	6200 6100 7000	2 19 19	8N 12N 9N	5W 18E 8E	1936 1941 1938	1,2,3,4,5 3,4	3 1,2	East Entrance	10E6 10E5	7000 7100	17	52N 52N	109W 110W	1948 1936	1,2,3,4,5	6	Oold Creek Lk. Hoodoo Creek	13010 1501	7200 6200	14 9	8N 14N 5N	12¥ 27₩ 13₩	1949 1937 1936	4,5	2
Kinge Hill Pionio Orounde	1001 1206	7950 6500	35 10	1,3N 5N	75 6W	1934 1941	3,4 3,4,5 2,3,4	3 4	Sylvan Pass (NOWOOD CREEK		7100	12)ŁN	ITOM	1730	1,2,3,4,5	O	Intergaard Lubrecht Porest # North Fork Jocko	1304 6 1308 1387	6450 4400 6330	ıı 3	11/N 17N	15W 17W	1951 1941	2,3,4 1,2,3,4,5 3,4,5	12 5
Pipestone Pase Stemple Pase Ten Mile Crock L	12D1 12G1 12G2	7200 6900 6250	11 16 13	1N 13N 8N	7W 7W 6W	1938 1934 1935	2,3,4,5 3,4,5 1,2,3,4,5	3	Cold Springs Camp Medicine Lodge Lk		8700 9500	1 7	50N 51N	88w 87w	1956 1956	2,3,4,5	1	Pipestone Pase Red Lion	12D1 13C12	7200 7000	10 27	ln 6n	7W 13W	1938 1958	2,3,4,5	1
Ten Mile Creek M Ten Mile Creek U	1203 1204	6800 8000	13 19	8N 8N	6W 5W	1934 1935	1,2,3,4,5	3	Munkers Pass North Powder	7E8 7E36	9700 8300	11 20	48N 47N	85W 85W	1950 1956	2,3,4,5 2,3,4,5 2,3,4,5	i	Slide Rock Mt. Southern Crees	1302	7100	35	10N 5N	16W 13W	1937 1936	3,4,5 և 2,3,և	1
(TETON RIVER)									Onion Gulch Tensleep Lake Tensleep R.S.	7E27 7E26 7E7	8100 9075 8300	31 33 30	48n 50n 49n	85W 86W 86W	1956 1956	2,3,4,5 2,3,4,5 2,3,4,5	1	Stemple Pase Storm Lake	1201 1307 1306	6900 7780 6500	16 19 19	13N LN 5N	7W 13W 13W	1934 1939 1936	3,4,5 2,3,4	3 1
Freight Grack Waldron Greek West Fork	12A1 12B2	6000 5600	13 16	26N 25N	10W 9W	1948 1948	3,4 3,4	1	Tyrell R.S.	7E35	8300	30	49N	86W	1935 1956	2,3,4,5	î	Stuart Mill Stuart Mountain TV Mountain	1301 14B1	7400 6800	6	1/1N 1/5N	18W 19W	1936 1956	2,3,4 1,2,3,4,5	1,2
(SUN RIVER)	1281	6000	6	25N	9₩	1948	3,4	1	(SHELL CREEK) Bald Mountain	7E21	9600	33	56N	91W	1956	2,3,4,5	1	East Fork R.S. Gibbons Pass	13D1 13D2	5400 7100	16 և	2N 2S	17W 19W	1937 1934	1,2,3,4,5	1 2 1
Benchmark Cabin Creek	1288 1286	5500 5400	9 33	20N 23N	10W	1948 1949	3,4	1	Beaver-Tongue Div Bone-Spring Div.	. 7520 7518	9200 9200	33 12 32 15	55N 55N	91W 89W	1956 1956	2,3,4,5 2,3,4,5	1	Lolo Pase Nez Perce Camp	14:05 14:02	5230 5580	16 19420	38N 1S	15E 23W	1956 1937	3,4,5,5; 3,4,5	1
5-Bull Gates Park	1289 1285	5600 5300	36 31	20N	10W 10W	1949 1948	3,4 3,4 3,4 3,4 3,4	1,2 1,2 1,2	Granite Creek Cam Granite Pass Horse-Trail Div.	P 7E22 7E17 7E19	7800 8950 9200	19 29	53N 54N 55N	89W 88W 90W	1956 1956 1956	2,3,4,5 2,3,4,5 2,3,4,5	1	Neż Perce Pass Powell R.S. Skalkaho Summit	1401 1406 1303	6575 4230 7259	32 33 30	28 N 37N 6N	17E 14E 17W	1937 1956 1937	1,2,3,4,4½,5 3,4,5,5	
Goat Mountain Wrong Ridge	12B7 12B3 12R4	7000 6800 5700	20 17	22N 25N	10W 10W	1934	3,կ 3,կ 3,կ	3 1,2	Ranger Cresk Shell Creek	7EL 7E23	8800 9600	32 12	53N 52N	88W 58W	1935 1956	2,3,4,5 2,3,4,5	1	Sauga di Sauga di	1,00			AN RIVER		1731	4	1
Wrong Creek (MARIAS RIVE		5700	32	25N	10W	1949	باواز	1,2	(PORCUPINE CR	EEK) Wyomi	NE .							ST. MARY RIVER								
Hariae Pass	13A5M	5250	34	30N	14W	1934	1,2,3,4,5	3	Five Spge. Palls Medicine Wheel	7E31 7E30	7500 9000	19 24	56n 56n	92 W 92 W	1956 1956	2,3,4,5 2,3,4,5	1	Iceberg Lake #3 Josephine Upper	13A3 13A15	5000	48°-501		1130-431 1130-421	1956	5	3,9
(MILK RIVER)									(TONGUE RIVER) Wyoming								Josephine Lower # Mount Allen #7 Piegan #6	9 13A14 13A7 13A6	5700	480-461 480-461		1130-41' 1130-41'	1922	5	3,9
Rocky Boy (MUSSELSHELL	9AL RIVER)	5200	15	28N	16E	1941	3,4	7	Beaver Tongue Div Big Goose #1	7E2	9200 7700	12 4	55N 53N	91W 86W	1956 1935	2,3,4,5	1	Ptarmigan #8	1348	5800	480-501		1130-lili	1937	5	3,9 3,9
Oranshopper	1002	7000	19	9N	38	1938	3,4	2	Big Goose #2 Bone-Spring Div. Burgess R.S. #1	7E32 7E18 7E1	7700 9200 7900	ц 32 36	53N 55N 56N	86¥ 89¥ 89¥	1955 1956 1950	2,3,4,5 2,3,4,5 2,3,4,5	1 1	a. Numerals 1,2,	3 1, 200	nofer t	famus	1 9		10-00-0	10-11	
									Burgese R.S. #2 Dome Lake #1	7533 753	7900 8800	36 11	56N 53N	89₩ 87₩	1955 1950	2,3,4,5 2,3,4,5	1	b. Numerals 1,2,							•	., 1.
									Dome Lake #2 Gloom Creek Granite Pase	7E3L 7E1L 7E17	8600 9300 8950	11 32 19	53N 55N 5UN	87w 87w 88w	1950 1956 1956	2,3,4,5 2,3,4,5 2,3,4,5	1 1	1. Soil Conserva 2. U.S. Porest		ce				ontana Exity of Bo	comment Stat	ion
																		3. U. S. Geologi 4. Montana Power	cal Survey Company				9. D	ominion V . S. Fiel	Water & Power and Wildlife	Service
mano des trondetos de pu 1369																		5. U.S. Indian 6. National Park			Soil Mo			ontana St	au of Reclama ate Poreetry	School
																								E 0 33	1.8L SOW_1.6	-2/21

^{5,}R-11,484 59H-46-3(3)

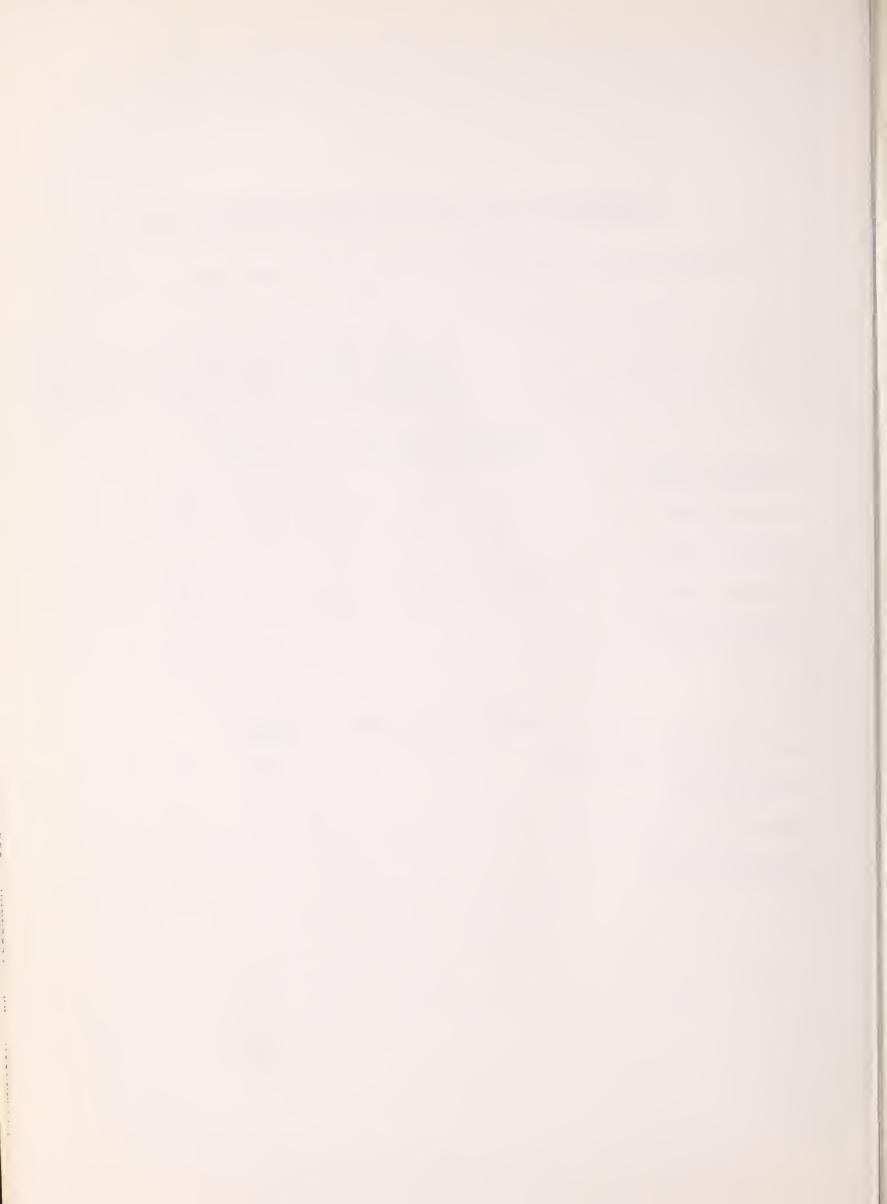
AVAILABLE SOIL MOISTURE - ABOUT MARCH 1, 1959

			PI	ROFILE Total Water-	-	OISTURE in Inche		
Station	No.	Elev.	Depth (In.)	Holding Capacity (In.)	1959	1958	1957	Yrs.
		COLUM	BI A- FLATHE	EAD DRAINAGE				
Marias Pass	13 A 5M	5250	48	8.39	6.93	5.45	5.30	2
Spotted Bear R.S.	13B2M	3700	28	-	5.05	4.60	4.98	2
Trout Lake	13A12M	3600	48	-	12.56	12.36	12.59	2
					And the state of t			e seguin e minis y dimensione.
		MISSO	URI-GALLAT	IN DRAINAGE				
College Site	llD2M	4860	50	14.48	Frozen	5.55	7.62	2

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

Summary of Snow-Survey Data by Tributary Watersheds March 1, 1959

TRIBUTARY BASINS	No. of Courses	Years	Express	sed as Pe	
	Averaged	Used	1958	19 5 7	Average
MISSO	OURI RIVER BA	SIN IN M	ONTANA	The second secon	
JEFFERSON RIVER	23	11-15	113	106	97
MADISON RIVER	7	14-15	118	82	91
GALLATIN RIVER	4	15	115	122	114
MISSOURI MAIN STEM	20	10-15	172	157	132
UPPER YELLOWSTONE	8	11-15	130	98	98
COLUM	ÆBIA RIVER BA	SIN IN MO	ONTANA		
KOOTENAI RIVER ABOVE LIBBY	11	10-15	130	96	99
FLATHEAD RIVER	20	8-15	133	136	128
UPPER CLARK FORK	21	8-15	123	135	135
BITTERROOT RIVER	7	15	101	107	98
			1		



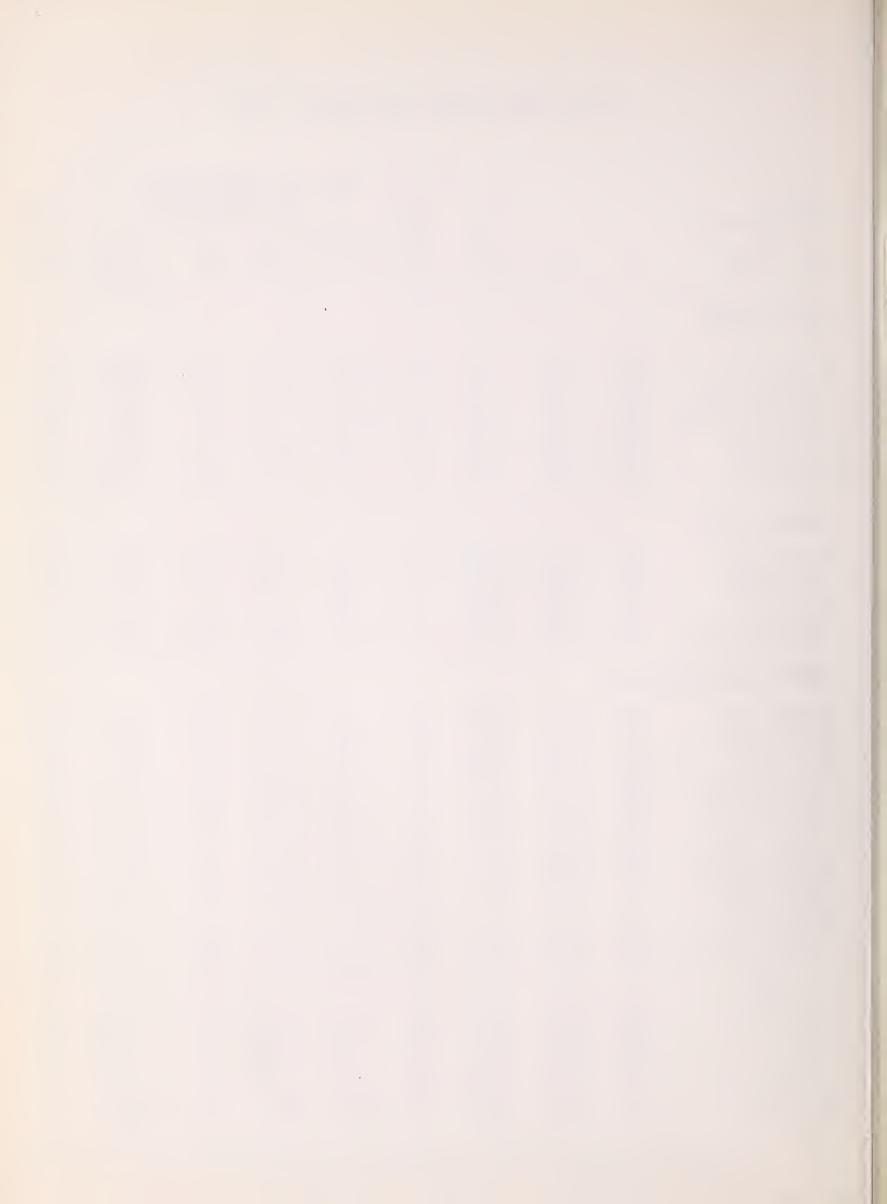
					SNOW C	OVER M	EASUREME	NTS	
MISSOURI				1959			ast Reco		Total
DRAINAGE BASIN AND			Date of	Snow Depth	Water Content		Content		Years of
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	1958	1957	Average 1938-52	
JEFFERSON RIVER						and the state of t			
(Rock-Beaverhead) Lakeview Canyon Lakeview Ridge Limekiln White Pine Ridge #Camp Creek #Kilgore	11E4 11E3 12E2 12E1 12E3 11E12	6930 7400 6950 8850 6800 6200	2/27 2/27 2/21 2/21 2/27	36 30 T 16 34	8.6 7.8 2.9 8.1	7.7 7.3 1.8 6.6 7.6 7.2	9.7 8.0 0.7 2.6 8.1 9.2	10.0% 7.4% 1.3% 4.6% 9.2 9.9	11 11 11 11 23 19
(Horse Prairie) Bloody Dick Gold Stone Lemhi Pass Selway Junction Terrell Creek Trail Creek (Big Hole)	13D10 13D9 13E1 13D11 13D12 13E2	7600 8100 7400 6800 6650 7090	2/28 2/28 2/26 2/25 2/25 2/26	38 44 31 22 14 28	9.3 13.0 7.8 5.3 3.3 6.9	7.9 10.0 6.4 5.4 4.3 6.0	10.0 12.0 5.9 7.0 4.0 5.9	10.1** 13.3** 7.3** 7.0** 4.3** 6.6**	11 11 11 11 11
Below Big Hole Pass Big Hole Pass East Boundary Gibbons Pass Jahnke Creek Miner Forks Miner Lake #Moose Creek Storm Lake	13D4 13D3 13D5 13D2 13D8 13D6 13D7 13D16 13C7	6900 7440 6700 7100 7340 7300 6720 6200 7780	3/2 3/2 3/2 3/2 2/28 3/1 3/1 2/25 2/214	45 53 26 68 32 37 27 47 45	13.0 15.0 7.4 19.7 8.9 10.0 7.0 14.4 12.4	10.9 12.4 5.8 18.3 7.5 8.2 5.2 13.4 9.0	11.6 12.6 6.0 20.9 10.2 10.3 5.6 13.9 9.0	12.8** 14.8** 7.0** 20.4 9.5** 10.5** 14.8* 10.8**	11 11 25 11 11 14 21 6
(Wise River) Anderson Meadow Elk Horn Wise River	13D14 13D15 13D13	7000 8450 6300	3/3 2/27 3/3	26 36 15	6.5 8.8 6.0	5.6 7.6 4.4	5.3 7.9 4.1	7.2** 8.1 4.8**	11 24 11
(Ruby River) Flashlight	12D3	6950	3/4	11	2.7	3.6	2.4	3.9**	111

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Average for period of record. #Adjacent Basin.



MISSOURI				1959	SNOW C		EASUREMEI		M-4-7
DRAINAGE BASIN			Date	Snow	Water	1	ast Recor Content	(In.)	Total Years
AND SNOW COURSE	No.	Elev.	of Survey	Depth (In.)	Content (In.)	1958	1957	15-Year Average 1938-52	
MADISON RIVER						m aprima e			
Hebgen Norris Basin Twenty-One Mile West Yellowstone #Big Springs #Island Park #Valley View	11E5 10E2 11E6 11E7 11E9 11E10 11E8	6550 7500 7150 6700 6500 3600 6500	2/26 3/1 2/27 2/26 2/26 2/25 2/26	44 33 51 33 59 51 47	10.5 9.1 14.3 8.2 16.3 13.1 11.6	9.1 7.9 11.5 6.5 14.4 11.8 9.2	12.3 9.1 17.5 11.8 22.0 15.4 13.6	11.2 8.6% 14.7 10.6 18.3 14.6 13.0%	25 16 22 25 23 23 14
GALLATIN RIVER						-			,
Devil's Slide Hood Meadow Mystic Lake New World Twenty-One Mile	10D4 10D3 10D2 10D1 11E6	8100 6600 6600 6700 7150	2/28 2/28 Est. 2/27 2/27	60 28 34 51	19.9 8.2 8.5 10.6 14.3	17.2 8.6 - 8.5 11.5		16.0 7.1 - 8.6* 14.7	24 24 - 17 22
MISSOURI RIVER MA	IN STEM								The state of the s
Chessman Res. Crystal Lake Grasshopper King's Hill Picnic Grounds Pipestone Pass Stemple Pass Tenmile, Lower Tenmile, Middle Tenmile, Upper (Teton River)	1205 901 1002 1001 1306 12D1 1201 1202 1203 1204	6200 6100 7000 7950 6500 7200 6900 6250 6800 8000	2/26 3/4 3/2 2/27 3/1 2/27 3/1 3/1	21 56 22 50 16 22 47 29 31 47	5.6 15.2 5.0 14.4 3.6 5.0 13.6 7.6 9.6 13.4	1.9 9.7 3.5 11.2 4.0 3.7 8.9 4.9 8.3 11.2	7.6 2.7 10.0 3.9 3.6	4.3 10.2* 4.3 11.3 4.4** 4.2 8.4 5.9 8.6 11.2	23 18 21 25 14 21 25 24 25 24
Freight Creek Waldron Creek West Fork	12A1 12B2 12B1	6000 5600 6000	3/1 3/1 3/1	58 29 50	18.8 8.0 15.7	9.5 3.6 7.8	13.8 5.4 11.8	15.0%% 6.6%% 14.3%%	11 11 11
(Sun River) Benchmark Cabin Creek Five-Bull Gates Park Goat Mountain Wrong Creek Wrong Ridge	12B8 12B6 12B9 12B5 12B7 12B4 12B3	5500 5400 5600 5300 7000 5700 6800	3/2 3/2 3/2 3/2 2/25 3/2 3/2	34 40 29 47 61 56 72		4.6 4.5 3.1 7.6 6.6 12.3 15.2	5.8 5.8 4.2 8.8 9.4 13.0 18.6	9.3** 6.6** 6.6** 9.8** 8.8 14.8** 20.6**	10 10 10 25 10

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Average for period of record. #Adjacent Basin.



			<u> </u>		SNOW C	OVER M	EASUREME	Mrp.S]
MISSOURI				1959	DIVON O	1	ast Reco		Total
DRAINAGE BASIN			Date of	Snow	Water Content	Water	Content		Years
SNOW COURSE	No.	Elev.	Survey	(In.)		!	1957	Average 1938-52	1
MISSOURI RIVER	MAIN STEM	(Contd)							
(Marias River)									ns descriptions and the second
Marias Pass (Milk River)	13A5	5250	2/27	61	19.2	14.0	17.2	15.6	25
Cypress Hills Cypress Hills Cypress Hills Cypress Hills	Course A Course C Course D	4100 3450 4000 2700	3/2 3/2 3/4 3/5 2/27	9 6 16 7	2.7 2.2 6.9 1.8 4.7	1.3 1.8 0.5	1.8 3.4 0.9	2.2** 1.4** 3.7** 1.2**	6 6 6
Rocky Boy (Musselshell) Grasshopper	9 A l 1002	5200 7000	3/2	20	5.0	2.8 3.5	5.8 2.7	4.6* 4.3	18 21
UPPER YELLOWSTO	ONE								
Camp Senia Canyon Cooke City Crevice Mountai	•	7890 7750 7400 8400	3/6 3/1 3/2 2/27	25 49 32 31	5.9 12.7 7.5 7.5	4.3 10.3 4.6 5.3	3.1 14.8 7.7 5.3	4.6** 10.7* 7.0 8.3*	1) ₁ 20 22 20
Independence Lake Camp Lake Camp (New) Lodgepole, Wyo. Lupine #Aster Creek #Thumb Divide		8000 7850 7850 8200 7300 7700 7900	3/1 3/1 3/2 3/2 2/26	35 31 42 35	8.1 7.4 9.9 9.5	7.0 5.9 6.8 5.6 21.8 15.3	7.4 6.8 9.2 9.8 29.8 19.8	8.8* - 10.1** 8.9* 24.5 19.8**	19 2 3 19 40 11
(Shields River) Porcupine	1003	6500	3/1	Est.	5.2	4.5	4.8	5.2	21

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Average for period of record. #Adjacent Basin.



				SNOW COVER MEASUREMENTS							
	MISSOURI DRAINAGE BASIN AND			Date of	1959 Snow Depth	Water Content	Water	ast Recor Content	ALTONOMIC MINES AND ADDRESS OF THE PARTY OF	Total Years of	
	SNOW COURSE	No.	Elev	Survey	(In.)	(In.)	1958	1957	Average 1938-52	Record	
	LOWER YELLOWSTONE	(Wind	River)								
	Big Warm Brooks Lake Burroughs Creek Dinwoodie	9F12 10F8 9F4 9F10	8800 9200 8800 10000	2/18 2/19 2/20	35 51 37	8.1 13.3 9.7	5.7 17.6 8.8 6.7	6.7 17.5 9.2 10.0	21.5* 13.5** 10.9**		
	#Dinwoodie Glaciers Dry Creek DuNoir Geyser Creek Little Warm Sheridan R.S. #2 T-Cross Ranch	9F17 9F9 9F6 9F7 9F8 9F14 9F3	10500 9500 8750 8500 9500 7500 8000	2/27 2/20 2/18 2/19 2/19 2/18 2/19	37 25 30 26 55 27 29	9.7 5.7 6.0 14.1 5.8 6.0	3.0 3.8 3.0 9.4 2.5	5.2	5.8** 7.6* 7.1** 14.7**	18 10 10 4 18	
9.0	Togwotee Pass	10F9	9600	2/27	87	26.8	21.5	22.6	26.3**	9	
	Blue Ridge Bruce's Camp Hobbs Park Mosquito Park R.S. Sawmill Glade #South Pass St. Lawrence R.S. Trout Creek #Twenty Lakes	8G2 8G5 9G3 9G4 8G1 8G3 9F11	Agie Riv 9500 6500 10000 9500 8500 9000 9000 8400 10500	7er) 3/2 2/27 3/2 2/25 3/2 3/2 2/21 3/2 2/27	26 14 41 22 23 32 21 21 24	5.8 3.2 11.3 4.8 5.1 8.4 4.6 4.4 5.3	5.7 7.5 3.4 4.6 7.2 2.0 3.0	7.1 T 13.1 4.4 3.9 10.8 4.0 3.5	10.1* 16.2** 6.9* 6.1* 11.8** 5.9* 5.1**	15 19	
	LOWER YELLOWSTONE	(Owl C	reek)								
	Beavers Mill Owl Creek	9F2 8F1	8900 8700	2/26 2/26	26 20	5.9 5.0	3.6	3.5 2.9	6.5** 4.5**		
	LOWER YELLOWSTONE	(Greyb	ull Rive	er)							
	Timber Creek #2 Wood River #2	9 E 3 9Fl	8800 8000	2/24 2/25	11 19	2.8 4.6	2.3	2.6	2.8 <u>**</u>	/ <u>1</u>	

^{*} Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

^{**} Average for period of record.

**/Timber Creek #1 abandoned. Timber Creek #2 average obtained from relationship of old and new courses.

[#] Adjacent drainage. Located close to Divide.

Aerial Stadia Marker. Water content estimated from snow depth.



					SNOW C	OVER M	EASUREME	NTS	
MISSOURI DRAINAGE DASIN			Dato	1959	Tulla the come		ast Reco		Total
DRAINAGE BASIN AND			Date of	Snow Depth	Water Content		Content	15-Year	Years of
SNOW COURSE	No.	Elev.	Survey	(In.)		1958	1957	Average 1938-52	Record
LOWER YELLOWSTONE	(Shosho	ne Rive	r)						The second secon
East Entrance Sylvan Pass	10E6 10E5	7000 7100	2/27 2/27	44 51	11.4	8.3	10.9	11.2** 13.1*	10 15
Dy I van 1 a 3 3	±0±0	1 100	2/21) <u>+</u>		11.0	1201		
LOWER YELLOWSTONE	(Nowood	Creek)							
Cold Springs Camp	7325	8700	3/1	31	8.8	N.R.	3.8		
Medicine Lodge Lks		9500	3/1	42	10.9	N.R.	7.1		
#Munkres Pass Onion Gulch	7E8 7E27	9400 8100				N.R. N.R.	6,5 7.0		
Tensleep Lake	7E26	9075				N.R.	7.4		
Tensleep R.S. Tyrell R.S.	7E7 7E35	8300 8300				5.0 N.R.	5.1 5.5)4 1
LOWER YELLOWSTONE	(Shell	Creek)					* Permission of the state of th		
#Bald Mountain	7E2l	9600	2/25	64	20.8	12.6	13.0		3
#Beaver-Tongue	7E20	9200	2/24	62	19.8	11.8	12.0		3 3 3 3 4
#Bone-Spring Granite Creek Camp	7E18 7E22	9200 7800	2/27 2/28	58 27	16.4 6.4	10.2 3.2	11.7		3
#Granite Pass	7E17	8950	2/27	54	15.3	9.8	12.1		3
Ranger Creek	7E4	8800	2/27	39	9.7	6.2	6.1		74
LOWER YELLOWSTONE	(Porcup	ine Cre	ek)			The state of the s			
Five Springs Falls	7 E 31	7500	2/27	38	10.8	4.6	3.2		3 3
#Medicine Wheel	7E30	9000	2/25	59	19.0	10.5	10.5		3
						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			

^{*} Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

** Average for period of record.

Adjacent Basin.



MISSOURI			- >	1959	SNOW C	OVER ME Pa	ASUREMEN st Reco		Total
DRAINAGE BASIN AND			Date of	Snow Depth	Water Content	Water	Content	Bender American Turk Tribunding Lands, Street, Street, Street, Street, Printers and	Years of
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	1958	1957	Average 1938-52	
LOWER YELLOWSTONE	(Tongue	River)							
#Beaver Tongue Big Goose #2 #Bone-Spring Burgess R.S. #2 Dome Lake #2 Gloom Creek #Granite Pass Sibley Lake Sucker Creek Steamboat Point Wood Rock G.S.	7E20 7E32 7E18 7E33 7E34 7E14 7E17 7E11 7E12 7E10 7E13	9200 7700 9200 7900 8800 9300 8950 8000 9000 7500 8500	2/24 3/1 2/27 2/25 3/1 2/26 2/27 2/28 2/26 2/28 2/26	62 30 58 35 45 54 42 46 33 41	19.8 7.2 16.4 8.7 8.6 13.1 15.3 11.7 12.8 9.0 10.1	11.8 4.3 10.2 4.4 7.8 9.8 6.4 7.7 3.5 6.2	12.0 4.5 11.7 4.1 7.0 7.6 12.1 5.7 7.0 3.8 7.2		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
LOWER YELLOWSTONE	(Powder	River)							To the state of th
#Muddy Creek G.S. #Munkres Pass Onion Gulch Soldier Park Sour Dough	7E28 7E8 7E27 7E5 7E6	7800 9700 8100 8700 8500	3/3 3/4	25 29	5.5 6.3	N.R. N.R. N.R. 3.7 4.7	2.0 6.5 7.0 1.7 4.1	3.8₩	2 3 2 7 3

^{**} Average for period of record.
Adjacent Basin.



				7000	SNOW C		EASUREME		
COLUMBIA DRAINAGE BASIN			Date	1959 Snow	Water		ast Reco Content	(In.)	Total Years
AND SNOW COURSE	No.	Elev.	of Survey	Depth (In.)	Content (In.)	1958	1957	15-Year Average 1938-52	of Record
KOOTENAI RIVER (ab	ove Lib	by, Mon	ntana)						
Brush Creek Ferguson Fernie Gray Creek Kimberley Marble Canyon Nelson Creek New Fernie Old Glory Red Mountain Sinclair Pass Sullivan Mine Upper Elk River Weasel Divide	IliAli Can Can Can Can Can Can Can Can Can Can	5000 3000 3500 5100 3800 5000 3050 4100 7000 6000 4500 5450	2/26 2/28 2/27 2/25 2/27 2/27 2/27 2/27 2/27 2/26 2/27 2/25	50 66 28 57 350 51 80 58 27 89	14.0 21.0 7.9 15.5 8.0 12.6 14.6 13.5 22.3 16.8 4.7 13.4 7.2 30.8	11.7 -6.7 12.6 5.2 11.2 14.6 12.3 25.7 14.0 3.6 10.6 5.3 25.3	11.4 - 8.4 17.7 7.1 15.5 15.7 13.8 21.3 17.4 6.1 12.3 8.0	12.9** 18.9** 8.1* 16.7** 6.8* 13.9** 14.0* 13.3** 25.6** 16.1 5.6** 13.1**	12 14 19 10 18 12 19 8 9 22 12 13 11 1
Basin Creek Big Creek Brush Creek Cattle Queen Coyote Hill Desert Mountain Goat Mountain Hell Roaring Div. Holbrook Kishenehn Logan Creek Marias Pass Mineral Creek N. Fork Jocko Spotted Bear Mt. Strawberry Lake Trinkus Lake Trout Lake Twin Creeks Upper Holland Weasel Divide	13B14A 13B3 14A4 13A1 13B10 13A2 12B7 14A3 13B13A 14A2 14A5 13A5M 13A16 13B7 13B2M 13B1 13A10 13B1 13B1 13B1 13B1 13B1	6750 5000 4700 4200 5600 7000 5700 4530 4300 4300 5250 4500 6330 7000 6500	2/26 3/3 2/26 3/2 3/2 2/27 2/25 2/25 2/26 2/27 3/2 3/1 3/2 3/2 3/2 3/25	38 134 50 97 45 50 94 45 40 40 40 40 40 40 40 40 40 40 40 40 40	12.4 31.7 12.1 9.6 11.3 19.2 23.5 48.4 18.4	8.4 42.9 11.7 26.1 29.5 12.6 30.9 14.3 9.5 14.3 13.8 13.8 13.8 13.8 13.8 13.8 13.8 13	5.7 34.7 11.4 25.6 9.4 13.5 10.0 8.8 17.2 18.3 35.6 12.1 30.8 14.1 27.2	8.8** 33.5* 12.9** 29.6** 9.9** 13.1** 8.8 27.2** 9.4** 10.2** 15.6 17.6** 36.0* 14.8** 35.7** 16.1** 11.0** 30.1**	8 18 12 14 12 15 25 9 14 12 25 2 18 11 8 9 11 8 9 1

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Average for period of record.



						-			1
					SNOW C		EASUREME		
COLUMBIA			7	1959			ast Reco		Record 23 12 8 6 2 6 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8
DRAINAGE BASIN			Date	Snow	Water		Content	· · ·	
AND SNOW COURSE	No.	Elev.	of	Depth			3057	15-Year	
SNOW COURSE	NO.	ritev.	Survey	(In.)	(In.)	1958	1957	1938-52	record
CLARK FORK									
Chessman Res. Coyote Hill East Fork R.S. Eldorado Mine Fish Lake Airstrip Fred Burr Pass Gold Creek Lake Hoodoo Creek Intergaard Lubrecht For. #6 N. Fork Jocko Picnic Grounds Pipestone Pass Red Lion Slide Rock Mt. Southern Cross Stemple Pass Storm Lake Stuart Mill Stuart Mt. #1 Tenmile, Lower Tenmile, Middle Tenmile, Upper TV Mountain #49 Meadows #Lookout	12C5 13B10 13D1 13C9 15C2 13C11 13C10 15C1 13C4 13C8 13B7 12C6 12D1 13C12 13C5 12C1 13C7 13C6 13C7 13C6 13C1 13C2 13C3 12C4 14B1 13B3 15B2	6200 4200 5400 7800 5000 8000 7200 6450 5400 6500 7200 7100 6500 7400 6500 7400 6800 8000 6800 5000 5250	2/26 3/2 2/26 3/2 2/24 2/26 3/2 3/2 3/2 3/2 2/27 2/24 3/1 3/1 3/1 3/1 2/24 2/27	21 40 28 63 97 50 28 132 62 25 43 47 42 28 29 31 47 62 100	5.6 12.4 7.1 20.5 36.2 25.3 15.3 7.6 48.4 5.0 212.4 13.6 12.4 13.6 12.4 13.6 13.6 13.6 13.6 13.6 13.6 13.6 13.6	1.9 9.5 1.9 1.9 1.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	2.1 9.4 13.1 16.9 10.6 - 6.1 35.6 9.8 9.6 9.6 27.2 4.9 9.6 27.8 30.3	4.3 9.9** 15.7** 35.9** 18.9** 50.2** 4.4** 4.4** 10.4** 10.4** 10.4** 10.8** 24.4* 10.8** 5.5.9** 10.2** 24.4* 10.3* 10.3** 10.3** 10.3** 10.3** 10.3** 10.3** 10.3** 10.3* 10.3** 10.3** 10.3* 1	12 8662653881421 14 23 25626 26 21 21 21 21 21 21 21 21 21 21 21 21 21
BITTERROOT	-						1		
East Fork R.S. Gibbons Pass Nezperce Camp Nezperce Pass TV Mountain #Lolo Pass #Moose Creek #Powell R.S.	13D1 13D2 14D2 14D1 14B1 14C5 13D16 14C6	5400 7100 5580 6575 6800 5230 6200 4230	2/26 3/2 2/27 2/27 2/24 2/25 2/24 2/25	28 68 39 48 62 84 47 43	18.6 28.0 14.4	12.7 11.0 14.4 28.5 13.4	20.9 11.4 12.4 13.6	5.5** 20.4 11.2* 15.2* 27.9** 14.8*	25 19 20 3 15 21

^{*}Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. **Average for period of record. #Adjacent Basin.



STATUS OF RESERVOIR STORAGE March 1, 1959

BASIN		USABLE	USAE	BLE STORAC	GE - 1000 A		
& STREAM	RESERVOIR	CAPACITY 1000 A.F.	1959	1958	ז הליז	1938-52	7ED C
DITUERI	TUBOUT VOIR	1000 A.F.	<u> </u>	1950	1957	AVG.	YRS
MISSOURI RIVER BA	ASIN - MONTANA						
Beaverhead Madison River Madison River Hyalite Creek Missouri River Missouri River	Lima Hebgen Lake Ennis Lake Middle Creek Canyon Ferry Hauser Lake	84.0 345.0 41.0 8.0 2043.0	31.1 168.2 38.9 4.2 1687.0	26.7 157.4 38.8 3.7 1575.0	6.4 158.1 38.4 3.1 1488.0	30.9* 234.7 34.1 3.6** 1332.0**	18 23 23 7 5
Missouri River Missouri River N.Fk. Sun River N.Fk. Sun River N.Fk. Sun River Marias River Birch Creek Dupuyer & Birch	& Lk. Helena Lake Helena Holter Lake Gibson Willow Creek Pishkun Tiber Swift Lake Francis	62.5 10.4 81.9 105.0 32.3 32.0 1316.0 30.0	59.0 9.4 45.3 76.1 29.3 19.7	59.0 9.2 76.7 29.0 19.8 12.3 625.2 19.0	62.5 10.5 78.8 39.6 23.4 16.5 630.7 23.7	46.2* 8.3** 53.3 59.6 12.9 15.6	19 13 21 23 23 23 23
Judith River Missouri River Milk River Milk River W. Rosebud Cr. Tongue River Swiftcurrent Cr.	Ackley Lake Ft. Peck 3/ Fresno Nelson Mystic Lake Tongue River	112.0 5.8 19410.0 127.2 66.8 20.8 68.0 66.1	8848.0 28.7 41.4 8.5 15.4 36.9	94.0 4.6 7748.0 55.9 49.8 7.4 9.0 21.0	90.0 3.7 6019.0 75.1 51.4 6.0 10.8 18.8	72.8 4.2* 11240.0* 56.2* 28.5 8.0 10.0* 19.0	23 19 18 18 23 23 17 23
MISSOURI RIVER BA	SIN - WYOMING						
Shoshone River Wind River Wind River Bull Creek Belle Fourche	Buffalo Bill Boysen Pilot Butte Bull Lake Key Hole	440.0 408.6A0 31.6 152.0 190.0A0	9.7 49.0	161.9 249.1 15.9 66.5 1.9	128.2 220.0 14.3 67.8 14.1	264.5 260.3** 14.5 56.7 13.3**	24 7 23 20 7

^{*} Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

*** Average for period of record.

3/ Gross contents: usable capacity less 617.0 A.F; minimum power pool 4,500 A.F.

AC Active Capacity - USBR Billings.



STATUS OF RESERVOIR STORAGE March 1, 1959

BASIN		USAE	SABLE STORAGE - 1000 ACRE FEET					
& STREAM	RESERVOIR	CAPACITY 1000 A.F.	1959	1958	1957	1938-52 AVG.	YRS.	
MISSOURI RIVER B	ASIN - NORTH DAKO	OTA						
Heart River Heart River Missouri River James River	Heart Butte Dickinson Garrison Lk. Jamestown	54.8AC 4.3AC 13805.0AC 20.0AC	3.7 2478.6	55.3 4.2 4448.0 10.4	43.7 3.2 535.2 4.7	53.4** 3.8**		
MISSOURI RIVER B	ASIN - SOUTH DAK)TA						
Belle Fourche Cheyenne River Cheyenne River Grand River Missouri River Missouri River Missouri River Cheyenne River	Belle Fourche Angostura Deerfield Shadehill Ft. Randall Gavins Point Oahe Pactola	185.0AC 160.0AC 15.1AC 84.0AC 4900.0AC 385.0AC Total 14.8AC	44.1 8.9 71.2	66.0 55.9 11.3 79.4 1552.4 325.1	37.0 27.8 8.2 133.4 1090.7 419.7	11.3** 134.4**	3 3 6 6 4 2 0 2	
COLUMBIA RIVER B.	ASIN - MONTANA						and the state of t	
Flint Creek S.Fk. Flathead Flathead River Flathead River 6, Flathead River 7,		31.0 3500.0 1791.0 42.8 98.6	26.1 2623.0 920.7 25.9 28.4	19.9 2088.0 872.6 26.0 19.7	19.2 1802.0 849.8 29.9 28.5	22.9* 2199.3** 679.2 21.1* 36.8*	19 15 18 18	

6/ Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River.

AC Active Capacity - USBR Billings.

^{*} Less than 15 years in 1938-52 period. Average for 15 years nearest the base period. ** Average for period of record.

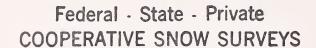
Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.



Agencies Cooperating in Collecting Data Contained in this Bulletin

- U. S. Forest Service Region I, Missoula, Montana
- U. S. Geological Survey Helena, Montana
- U. S. Army Corps of Engineers
 Portland, Oregon
 Seattle, Washington
 Omaha, Nebraska
 Riverdale, N. D.
- U. S. Indian Irrigation Service St. Ignatius, Montana
- U. S. Weather Bureau Helena, Montana
- U. S. Fish & Wildlife Service Red Rock Lakes Refuge Monida, Montana
- U. S. Bureau of Reclamation Billings, Montana Boise, Idaho
- Montana Power Company Butte, Montana
- Agricultural Experiment Station North Montana Branch Station Havre, Montana

- National Park Service Yellowstone National Park Glacier National Park
- Montana Experiment Station Montana State College Bozeman, Montana
- City of Bozeman Bozeman, Montana
- Bonneville Power Administration Portland, Oregon
- Montana State School of Forestry Montana State University Missoula, Montana
- Soil Conservation Service Montana, Wyoming, Idaho
- Soil Conservation Districts
 Montana Counties
- Johnson Flying Service, Inc. Missoula, Montana
- Water Rights Branch
 Dept. of Lands & Forests
 Victoria, British Columbia
- Department of Northern Affairs & National Resources Calgary, Alberta



Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"The Conservation of Water begins with the Snow Survey"